

Attorney's Docket: 2000DE441D

Serial No.: 10/506,095

Art Unit 1712

Response to Office Action, Dated 12/27/2005

This listing of claims will replace all prior versions, and listings of claims in the application:

1.(Deleted)

2.(Deleted)

3.(Deleted)

4.(Deleted)

5.(Deleted)

6.(Deleted)

7.(Currently Amended) A low-temperature-stabilized solution comprising from 1 to 80% by weight of an organic solvent and a low-temperature-stabilized additive comprising:

A) a fatty acid mixture of

A1) from 1 to 99% by weight of at least one saturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms,

A2) from 1 to 99% by weight of at least one unsaturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms

and

B) at least one polar nitrogen-containing compound which is effective as paraffin dispersant in middle distillates, in an amount of from 0.01 to 90% by weight, based on the total weight of A1), A2) and B),

wherein the fatty acid mixture of A1) and A2) has an iodine number of at least 40 g of I / 100 g, and said at least one polar nitrogen-containing compound B) is a terpolymer comprising:

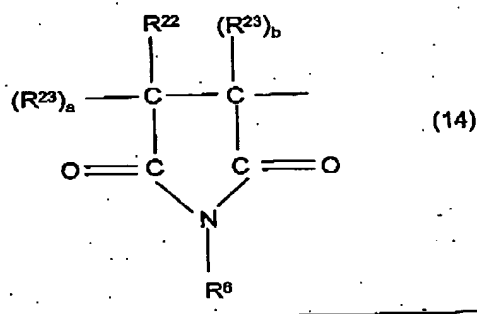
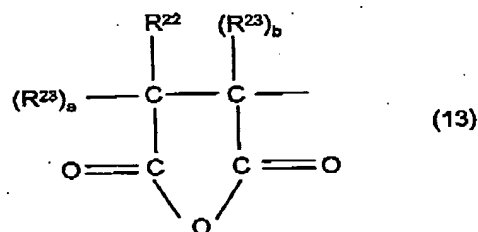
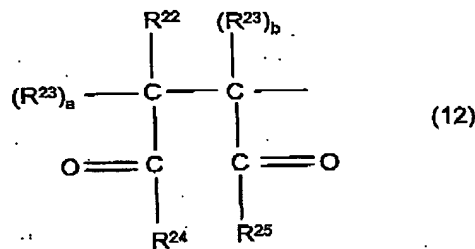
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- 1) 20 – 80 mol% of a divalent structural unit selected from the group consisting of formula 12, 14, 13, and mixtures thereof.

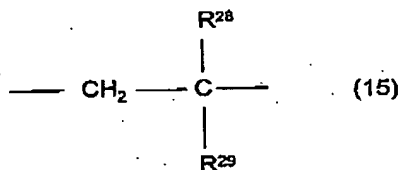


where

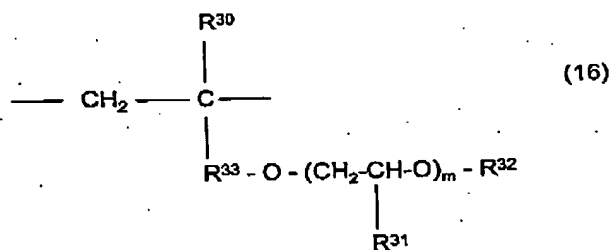
R²² and R²³, independently of one another, are hydrogen or methyl,

a and b are zero or one and a + b is one,

R²⁴ and R²⁵ are identical or different and are -NHR⁶, N(R⁶)₂ or -OR²⁷ or a combination thereof, and R²⁷ is a cation of the formula H₂N(R⁶)₂ or H₃NR⁶,

Attorney's Docket: 2000DE441DSerial No.: 10/606,095Art Unit 1712Response to Office Action, Dated 12/27/2005II) 19 - 80 mol% of a divalent structural unit of formula 15.

in which

R²⁸ is hydrogen or C₁-C₄-alkyl, andR²⁹ is C₈-C₈₀-alkyl or C₈-C₁₈-aryl, andIII) 1 - 30 mol% of a divalent structural unit of formula 16

in which

R³⁰ is hydrogen or methyl.R³¹ is hydrogen or C₁-C₄-alkyl.R³³ is C₁-C₄-alkylene.m is a number from 1 to 100.R³² is C₁-C₂₄-alkyl, C₅-C₂₀-cycloalkyl, C₈-C₁₈-aryl or -C(O)-R³⁴.where R³⁴ is C₁-C₄₀-alkyl, C₅-C₁₀-cycloalkyl or C₈-C₁₈-aryl.

8.(Deleted)

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9.(Deleted)

10.(Currently Amended) A fuel oil comprising, a middle distillate having a sulfur content of up to 0.05% by weight, and a low-temperature-stabilized additive comprising:

A) a fatty acid mixture of

A1) from 1 to 99% by weight of at least one saturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms,

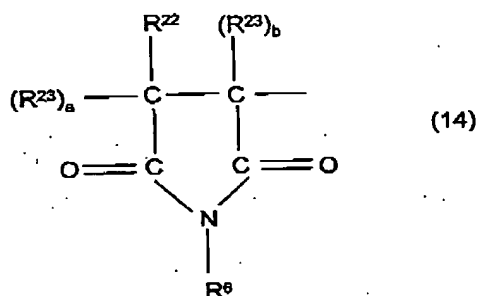
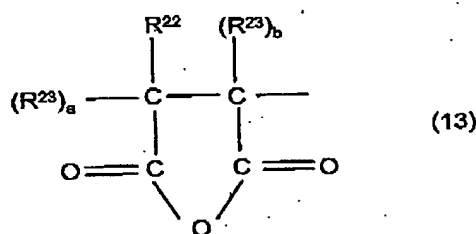
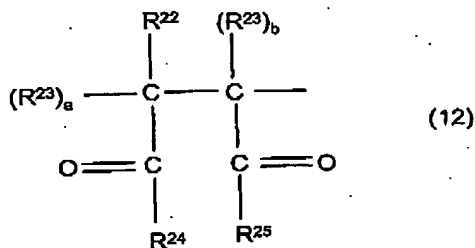
A2) from 1 to 99% by weight of at least one unsaturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms
and

B) at least one polar nitrogen-containing compound which is effective as paraffin dispersant in middle distillates, in an amount of from 0.01 to 90% by weight, based on the total weight of A1), A2) and B),

wherein the fatty acid mixture of A1) and A2) has an iodine number of at least 40 g of I / 100 g, and said at least one polar nitrogen-containing compound B) is a terpolymer comprising:

1) 20 — 80 mol% of a divalent structural unit selected from the group consisting of formula 12, 14, 13, and mixtures thereof.

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where

R^{22} and R^{23} , independently of one another, are hydrogen or methyl.

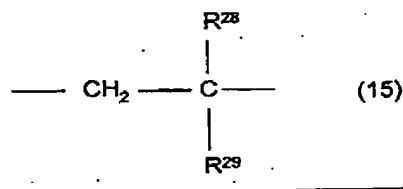
a and b are zero or one and $a + b$ is one.

R^{24} and R^{25} are identical or different and are $-\text{NHR}^6$, $\text{N}(\text{R}^6)_2$ or $-\text{OR}^{27}$ or a combination thereof, and R^{27} is a cation of the formula $\text{H}_2\text{N}(\text{R}^6)_2$ or H_3NR^6 .

II) 19 - 80 mol% of a divalent structural unit of formula 15

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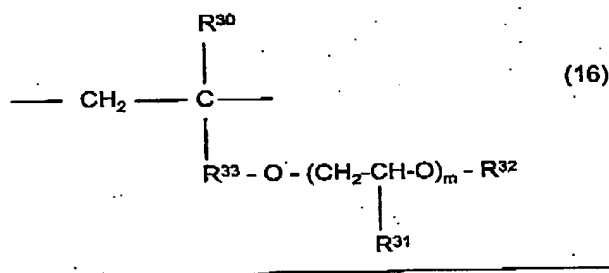


in which

R²⁸ is hydrogen or C₁-C₄-alkyl, and

R²⁹ is C₆-C₆₀-alkyl or C₆-C₁₈-aryl, and

III) 1 - 30 mol% of a divalent structural unit of formula 16



in which

R³⁰ is hydrogen or methyl,

R³¹ is hydrogen or C₁-C₄-alkyl,

R³³ is C₁-C₅-alkylene,

m is a number from 1 to 100,

R³² is C₁-C₂₄-alkyl, C₅-C₂₀-cycloalkyl, C₆-C₁₈-aryl or -C(O)-R³⁴,

where R³⁴ is C₁-C₄₀-alkyl, C₅-C₁₀-cycloalkyl or C₆-C₁₈-aryl.

11.(Currently Amended) A method for improving the lubrication properties of low-sulfur middle distillates having a sulfur content of up to 0.05% by weight, said

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method comprising adding to said low-sulfur middle distillates an additive comprising:

A) a fatty acid mixture of

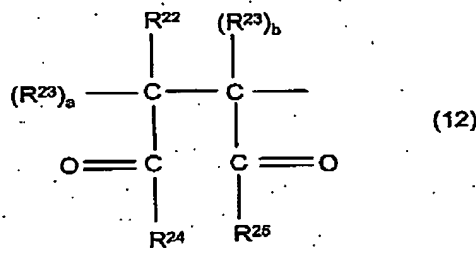
A1) from 1 to 99% by weight of at least one saturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms,

A2) from 1 to 99% by weight of at least one unsaturated mono- or dicarboxylic acid having from 6 to 50 carbon atoms, and

B) at least one polar nitrogen-containing compound which is effective as paraffin dispersant in middle distillates, in an amount of from 0.01 to 90% by weight, based on the total weight of A1), A2) and B),

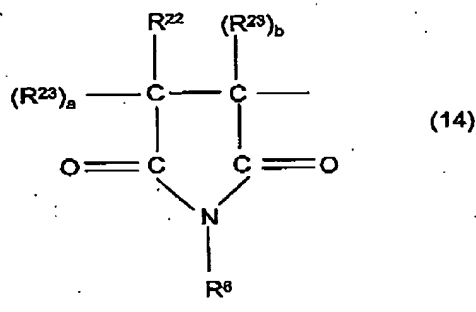
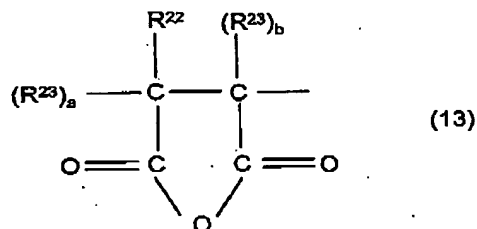
wherein the fatty acid mixture of A1) and A2) has an iodine number of at least 40 g of I / 100 g, wherein said at least one polar nitrogen-containing compound B) is a terpolymer comprising:

1) 20 – 80 mol% of a divalent structural unit selected from the group consisting of formula 12, 14, 13, and mixtures thereof.



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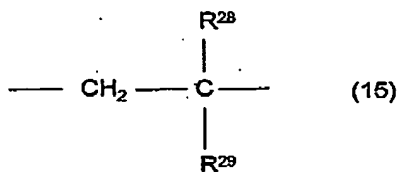
where

R^{22} and R^{23} , independently of one another, are hydrogen or methyl.

a and b are zero or one and $a + b$ is one.

R^{24} and R^{25} are identical or different and are $-NHR^6$, $N(R^6)_2$ or $-OR^{27}$ or a combination thereof, and R^{27} is a cation of the formula $H_2N(R^6)_2$ or H_3NR^6 .

II) 19 - 80 mol% of a divalent structural unit of formula 15



in which

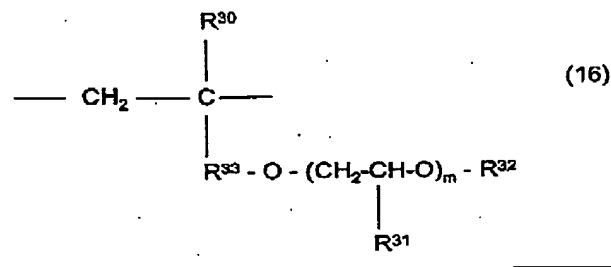
R^{28} is hydrogen or C_1 - C_4 -alkyl, and

R^{29} is C_5 - C_{50} -alkyl or C_6 - C_{18} -aryl, and

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III) 1 - 30 mol% of a divalent structural unit of formula 16



in which

R³⁰ is hydrogen or methyl.

R³¹ is hydrogen or C₁-C₄-alkyl.

R³³ is C₁-C₄-alkylene.

m is a number from 1 to 100.

R³² is C₁-C₂₄-alkyl, C₅-C₂₀-cycloalkyl, C₆-C₁₈-aryl or -C(O)-R³⁴.

where R³⁴ is C₁-C₄₀-alkyl, C₅-C₁₀-cycloalkyl or C₆-C₁₈-aryl.

12.(Previously Presented) The method of claim 11, wherein the additive further comprises an organic solvent selected from the group consisting of aliphatic hydrocarbon, aromatic hydrocarbon, oxygen-containing hydrocarbon, and mixtures thereof.

13.(Previously Presented) The method of claim 11, wherein component B comprises oil-soluble polar amine salts or amides.

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14.(Previously Presented) The method of claim 11, wherein component A) comprises from 1 to 40% by weight of resin acids.

15.(Previously Presented) The method of claim 11, wherein component A) comprises from 1 to less than 20% by weight of A1) and from greater than 80 to 95% by weight of A2).

16.(Currently Amended) The method of claim 11, wherein A1) and A2) are each a carboxylic mono- or dicarboxylic acid having from 12 to 22 carbon atoms.

17.(Previously Presented) The low-temperature-stabilized solution of claim 7, wherein the organic solvent selected from the group consisting of aliphatic hydrocarbon, aromatic hydrocarbon, oxygen-containing hydrocarbon, and mixtures thereof.

¹¹
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